

KPRG and Associates, Inc.

**UNDERGROUND INJECTION EXEMPTION PERMIT EXTENSION AND
MODIFICATION REQUEST**

September 28, 2011

*Received
09/29/2011*

Mr. Binyoti F. Amungwafor
Wisconsin Department of Natural Resources
2300 N. Dr. Martin Luther King, Jr. Drive
Milwaukee, Wisconsin 53212

Re: Remedial Action K&W Manufacturing, 8619 W. Lynx Avenue, Milwaukee, WI
BRRTS# 02-41-279720, FID# 241813770

VIA FEDERAL EXPRESS

KPRG Project No. 15807.4

Dear Mr. Amungwafor:

On September 23, 2010, the Wisconsin Department of Natural Resources (WDNR) issued an Underground Injection Control Approval – Temporary Exemption for the above referenced site. Under the exemption, KPRG proceeded to inject sodium permanganate into the defined source zone of tetrachloroethene (PCE) impacts. Only one round of injection was performed. All aspects of the permit were properly adhered to. Since the initial injection which occurred October, 2010, three rounds of groundwater monitoring have been performed. Figure 1 shows the locations of the initial injection points and all groundwater monitoring data to date is summarized in Table 1.

A review of the data in Table 1 indicates that groundwater within the source area, which is monitored by well MW-9, showed an initial substantial decrease but then groundwater concentrations of PCE and associated breakdown products of trichloroethene (TCE), cis-1,2-dichloroethene (DCE) and vinyl chloride (VC) rebounded and stabilized at concentrations one order of magnitude lower than prior to the injection work. Some rebound was also noted in downgradient monitoring well MW-2 and downgradient well MW-6 indicated all non-detects with no rebound effects as of the last round of sampling. Further downgradient wells have not yet shown decreases in impacts as the treated water may not yet have migrated to those locations. Overall the injection of sodium permanganate has worked well to reduce the source zone PCE impacts beneath the building and immediately adjacent to the back of the building.

Considering the current reduction in source zone PCE concentration and the documented natural reductive dechlorination which is occurring as evidenced by the presence of

breakdown products of TCE, DCE and VC, KPRG proposes to perform a follow-up “polishing” injection to further decrease groundwater impacts. However, rather than performing a second round of chemical oxidation, KPRG proposes to inject a biostimulant to enhance the naturally occurring reductive dechlorination. Therefore, this document is being submitted to request an extension and modification of the existing temporary exemption as discussed below.

Extension Request

A one year extension is being requested.

Modification Request

Rather than injection a chemical oxidant as done initially per the permit, KPRG is proposing to inject a biodegradation enhancement solution into groundwater as a polishing step for site remediation. KPRG proposes to use the Anaerobic BioChem Plus (ABC+) chemistry. The product is marketed by Redox Tech, LLC and is patented by Environmental Technologies, Inc (an Adventous Company). ABC+ is a mixture of ABC[®] formula and Zero Valent Iron (ZVI). Formulated and mixed on a site-by-site basis, up to fifty percent (50%) by weight of ZVI can be added. ZVI has been proven and widely accepted as an effective in situ remediation technology of chlorinated solvents such as TCA, PCE, TCE, and daughter products. The degradation process using ZVI is an abiotic reductive dechlorination process occurring on the surface of the granular iron, with the iron acting as an electron donor.

The addition of ZVI to the ABC[®] mixture provides a number of advantages for enhanced reductive dechlorination (ERD). The ZVI will provide an immediate reduction. The ABC[®] will provide short-term and long-term nutrients to anaerobic growth, which also assists to create a reducing environment. ABC[®] contains soluble lactic acid and a phosphate buffer that provides phosphates, which are a micronutrient for bioremediation, and maintains the pH in a range that is best suited for microbial growth. In addition, the corrosion of iron metal yields ferrous iron and hydrogen, both of which are possible reducing agents.

The ABC[®] and ZVI are mixed with potable water and emplaced in the subsurface simultaneously. The dilution factor (i.e. water content) can be adjusted to achieve optimal dispersion and distribution based on site-specific parameters such as well spacing, permeability of the formation, and contaminant concentrations. The solution can be emplaced by a variety of techniques, including injection through wells or drill rods (for permeable geologic environments such as sands and fractured rock), hydraulic fracturing (for lower permeable environments such as silt and clay), and through soil blending (for all unconsolidated shallow depth applications less than 20 ft bgs).

The proposed chemistry injection will occur at 26 injection points as shown on Figure 2. A total of 140 gallons of 12% ABC+ will be injected into each point. In accordance with

the current permit requirements, explosive limit monitoring will be performed in adjoining monitoring locations. Liquid extraction will be concurrently performed in the extraction wells previously installed at the site as part of the initial injection. The extraction from these wells during injection assists in distributing the chemistry through the aquifer matrix. The extraction of water will be performed using a Vac-truck. Extracted water will be temporarily stored in a portable above ground tank. At the completion of the injection work, the water will be sampled and profiled for proper off-site disposal.

Additional Verification Groundwater Monitoring (4 Quarters Post-Injection)

Within three weeks of the completion of initial injection, a quarterly groundwater monitoring program will be initiated for all existing monitoring wells (i.e., well MW-1 through MW-12, PZ-1 and PZ-2) and the new well MW-13 which was recently installed. One duplicate sample will be collected per round of monitoring for quality assurance purposes. The samples will be collected using the standard bail and purge method. Purge water will be collected in a 55-gallon drum for subsequent proper off-site disposal. Samples collected will be analyzed for VOCs. Field measurements of water level, pH, temperature, specific conductivity and oxidation-reduction potential (ORP) will be recorded. At this time a total of four quarters of sampling are proposed. The results of the monitoring will determine the effectiveness of the injection relative to contaminant concentration reduction and impacted groundwater plume stability. All well locations are shown on Figure 3.

WPDES Program Notification

The information provided in this submittal was also forwarded to Ms. Christine Lilek, Senior Wastewater Specialist with the WDNR WPDES program via e-mail.

KPRG and K&W Manufacturing appreciate your consideration of this matter. If there are any questions or if any additional supporting information is needed, please contact me at 262-781-0475.

Sincerely,
KPRG and Associates, Inc.

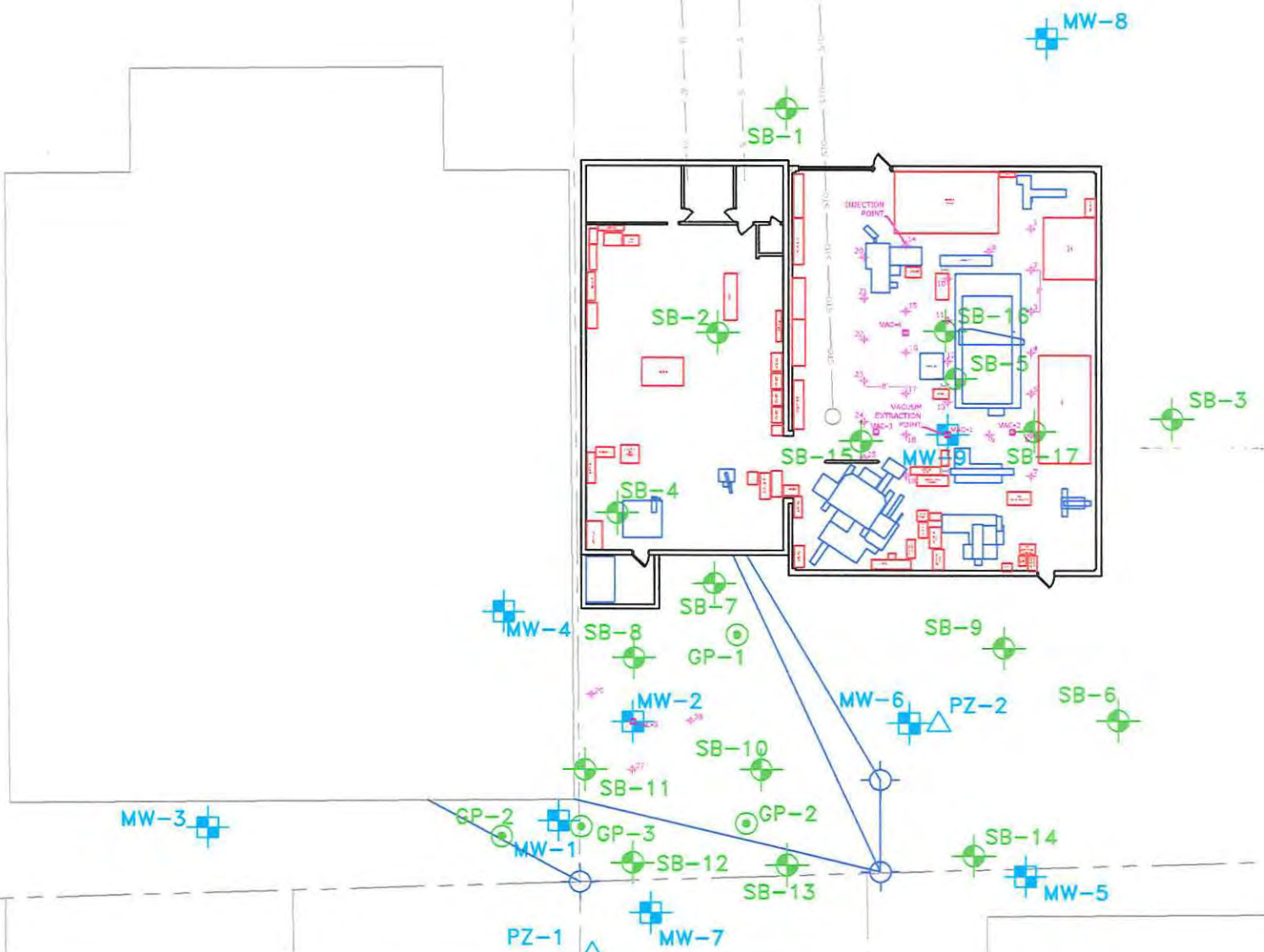


Richard R. Gnat, P.G.
Principal

cc: Mr. Greg Krieger, K&W Manufacturing

FIGURES












SIDEWALK

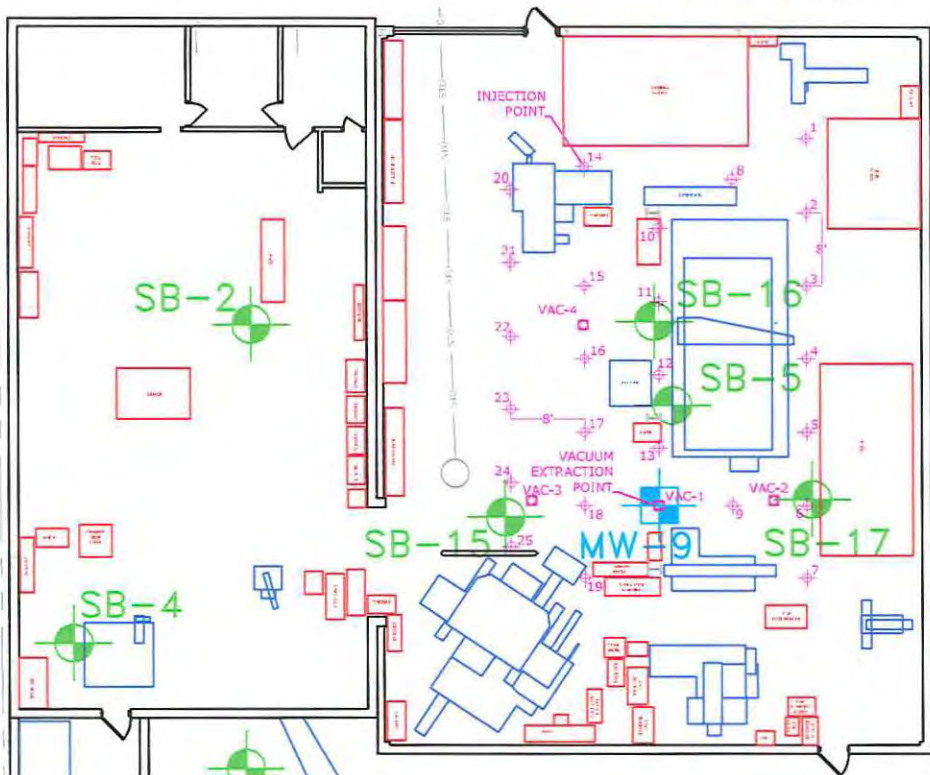


0 30'
APPROXIMATE SCALE

SITE PLAN

LEGEND

-  SB-1 SOIL BORING
-  MW-5 MONITORING WELL
-  PZ-1 PIEZOMETER
-  GP-2 KEY ENGINEERING SOIL BORING
-  1 CHEMICAL INJECTION POINT
-  VAC-1 VACUUM EXTRACTION POINT
-  OVERHEAD ELECTRIC
-  SEWER LINE
-  STORM SEWER LINE
-  WATER LINE
-  POWER POLE



0 20'
APPROXIMATE SCALE

CHEMICAL INJECTION POINTS LAYOUT BLOW UP

ENVIRONMENTAL CONSULTATION & REMEDIATION

K P R G

KPRG and Associates, Inc.

14665 West Lisbon Road, Suite 28 Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

INITIAL CHEMICAL OXIDATION INJECTION POINTS

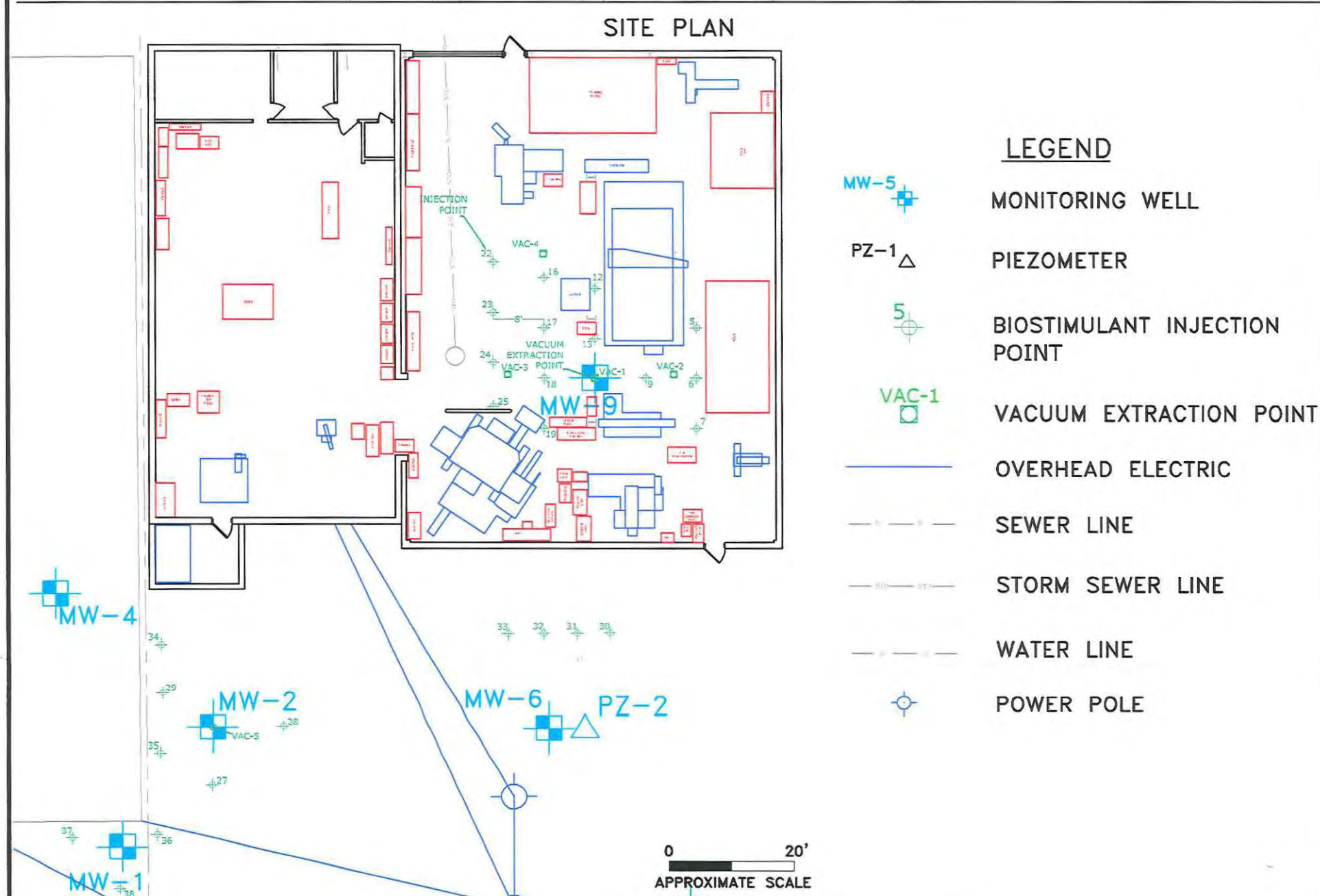
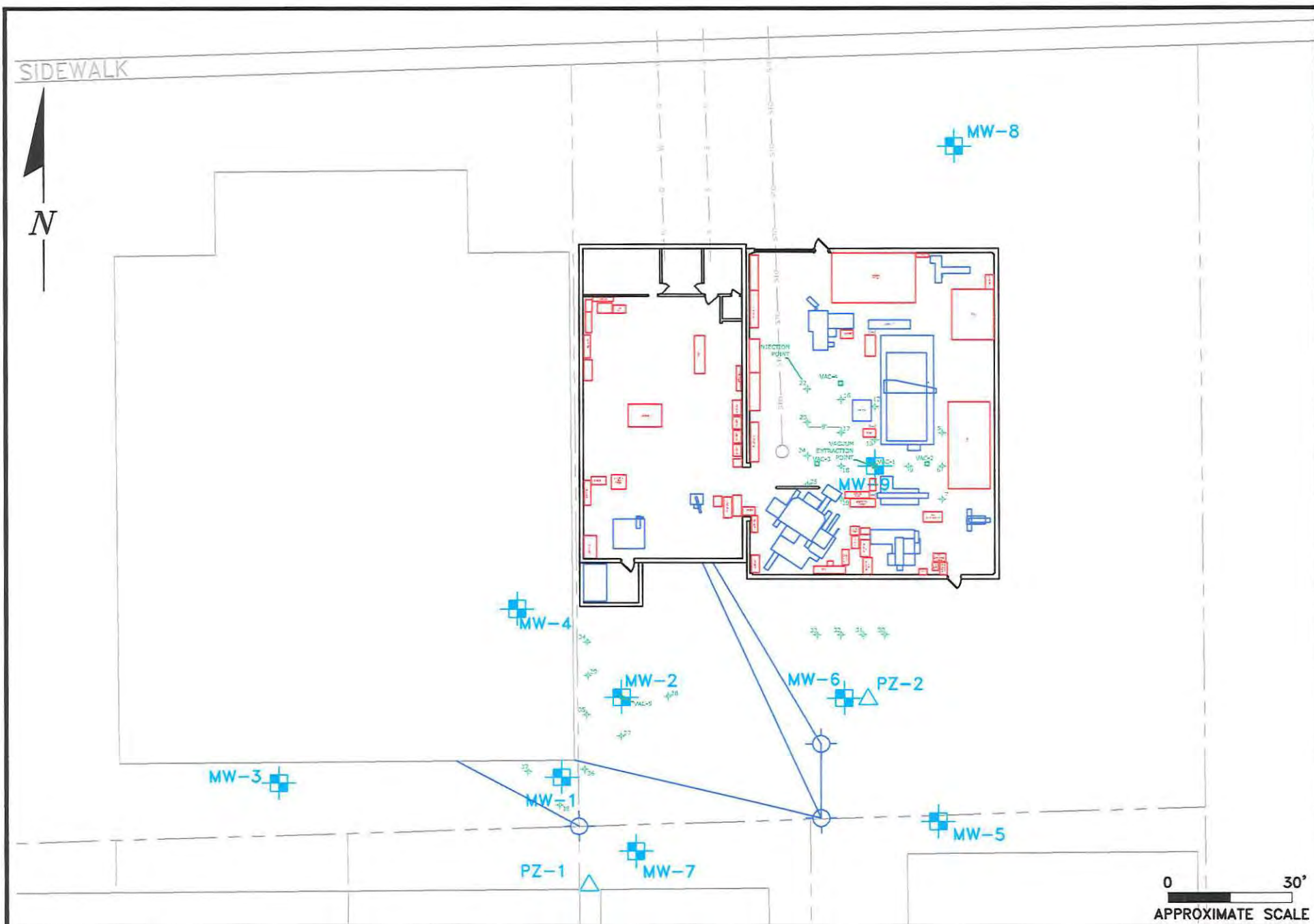
K & W MANUFACTURING CORP.
MILWAUKEE, WISCONSIN

Scale: SEE BARSCALE

Date: September 27, 2011

KPRG Project No. 15807.4

FIGURE 1



LEGEND

- MW-5 MONITORING WELL
- PZ-1 PIEZOMETER
- 5 BIOSTIMULANT INJECTION POINT
- VAC-1 VACUUM EXTRACTION POINT
- OVERHEAD ELECTRIC
- SEWER LINE
- STORM SEWER LINE
- WATER LINE
- POWER POLE

BIOSTIMULANT INJECTION POINTS LAYOUT BLOW UP

<p>ENVIRONMENTAL CONSULTATION & REMEDIATION</p> <p style="font-size: 2em; font-weight: bold; letter-spacing: 0.5em;">K P R G</p> <p style="font-size: 0.8em;">KPRG and Associates, Inc.</p> <p style="font-size: 0.7em;">14665 West Lisbon Road, Suite 28 Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478</p> <p style="font-size: 0.7em;">414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593</p>	<p style="font-weight: bold;">PROPOSED BIOSTIMULANT INJECTION POINTS</p> <p style="font-weight: bold;">K & W MANUFACTURING CORP. MILWAUKEE, WISCONSIN</p> <p>Scale: SEE BARSCALE Date: September 27, 2011</p> <p>KPRG Project No. 15807.4 FIGURE 2</p>
--	--



LEGEND

- PZ-1 PIEZOMETER
- SB-1 SOIL BORING
- MW-5 MONITORING WELL
- S SEWER LINE
- STO FORMER STORM SEWER LINE
- OVERHEAD ELECTRIC
- W WATER LINE
- POWER POLE

0 50'
APPROXIMATE SCALE

ENVIRONMENTAL CONSULTATION & REMEDIATION		MONITORING WELL LOCATION MAP	
		K & W MANUFACTURING CORP. MILWAUKEE, WISCONSIN	
14665 West Lisbon Road, Suite 28 Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478		Scale: 1" = 50'	Date: September 27, 2011
414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593		KPRG Project No. 15807.4	FIGURE 3

w:\e-pa\projects\env_mant\15807.4\injection permit modification\15807.4-monitoring_well_loc.dwg

TABLE

Table 1. Groundwater Monitoring Analytical Results for Detected VOCs - K&W Manufacturing, Milwaukee, WI

All values in ug/L unless otherwise noted

PARAMETER	SAMPLE ID DATE	WDNR NR 140 Standards		MW-1					MW-2					MW-3					MW-4					MW-5					MW-6										
		PAL	ES	10/8/2009	1/13/2010	12/22/2010*	4/6/2011	6/30/2011	10/8/2009	1/13/2010	12/22/2010*	4/6/2011	6/30/2011	10/8/2009	1/13/2010	12/22/2010*	4/6/2011	6/30/2011	10/8/2009	1/14/2010	12/22/2010*	4/6/2011	6/30/2011	10/8/2009	1/13/2010	12/22/2010*	4/6/2011	6/30/2011	10/8/2009	1/13/2010	12/22/2010*	4/6/2011	6/30/2011						
VOCs																																							
cis-1,2-Dichloroethene		7	70	864	1,060	965	1,160	1,260	1,050	563	<4,150	563	<4.2	7.3	1.1	1.4	2.0	1.1	1,310	1,870	1,530	1,790	1,980	530	672	731	365	556	4,240	2,010	<4,150	<415	<166						
trans-1,2-Dichloroethene		20	100	<222	<222	<222	<222	<222	<22.2	<44.5	<4,450	5.0	<4.4	<0.89	<0.89	<0.89	<0.89	<0.89	<178	<356	<356	<356	<356	<35.6	<89.0	<89.0	<89.0	<89.0	<111	<178	<4,450	<445	<178						
Tetrachloroethene		0.5	5	25,400	32,500	26,400	28,100	22,700	5,580	9,050	<2,250	56	672	188	35.3	56.0	80.9	54.5	45,100	56,200	56,100	58,100	45,500	9,510	12,900	10,700	5,050	7,680	20,300	20,000	<2,250	<225	<90						
Trichloroethene		0.5	5	438	502	552	625	539	430	339	<2,400	71	<2.4	11.2	8.9	8.4	4.7	7.7	2,000	2,350	2,170	2,120	2,230	341	411	376	184	304	3,860	2,310	<2,400	<240	<96						
Vinyl Chloride		0.02	0.2	<45.0	<45.0	<45.0	<45.0	<45.0	<4.5	<9.0	<900	1.3 J	<0.90	<0.18	<0.18	<0.18	<0.18	<0.18	<36	<72.0	<72.0	<72.0	<72.0	<7.2	<18.0	<18.0	<18.0	<18.0	<0.16	<22.5	<36.0	<900	<90.0	<36					
NATURAL ATTENUATION PARAMETERS																																							
Ethane		NE	NE	4.0 J	NA	NA	NA	NA	<0.32	NA	NA	NA	NA	<0.32	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.32	NA	NA	NA	NA	
Ethene		NE	NE	1.5 J	NA	NA	NA	NA	<0.47	NA	NA	NA	NA	<0.47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.47	NA	NA	NA	NA
Methane		NE	NE	50.8	NA	NA	NA	NA	6.9	NA	NA	NA	NA	<0.93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.93	NA	NA	NA	NA	
Sulfate (mg/L)		125*	250*	41.5	NA	NA	NA	NA	42.9	NA	NA	NA	NA	37.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
TOC (mg/L)		NE	NE	1.5 J	NA	NA	NA	NA	4.3	NA	NA	NA	NA	1.7 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
FIELD PARAMETERS																																							
Dissolved Oxygen (mg/L)		NE	NE	0.67	0.66	0.74	1.09	0.71	0.69	0.64	-	-	-	3.34	0.05	0.56	1.37	0.3	2.09	0.16	0.17	0.18	0.46	0.55	0.22	0.64	0.89	0.07	4.2	0.80	-	-	1.43						
Oxidation-Reduction Potential (mV)		NE	NE	84.3	114	-5.5	594.3	31.56	80.4	110	-	-	-	88.7	10.8	-9.6	69.43	-9.83	-125.4	18.4	82	26.53	6.66	89.9	128	220.5	74.33	41.4	69	145	-	-	643.1						

PARAMETER	SAMPLE ID DATE	WDNR NR 140 Standards		MW-7					MW-8					MW-9					MW-10					MW-11					MW-12					MW-13			
		PAL	ES	10/8/2009	1/13/2010	12/22/2010*	4/6/2011	6/30/2011	10/8/2009	1/13/2010	12/22/2010*	4/6/2011	6/30/2011	10/8/2009	1/13/2010	12/22/2010*	4/6/2011	6/30/2011	10/8/2009	1/13/2010	12/22/2010*	4/6/2011	6/30/2011	10/8/2009	1/13/2010	12/22/2010*	4/6/2011	6/30/2011	10/8/2009	1/13/2010	12/22/2010*	4/6/2011	6/30/2011	6/30/2011			
VOCs																																					
cis-1,2-Dichloroethene		7	70	441	238	272	288	392	<0.83	<0.83	<0.83	<0.83	<0.83	33,700	40,800	<1,660	12,600	32,700	5	10.4	14.3	10.3	13.3	2.4	<0.83	<0.83	<0.83	<0.83	<0.83	<0.83	<0.83	<0.83	<0.83	<0.83	<0.83	<0.83	<0.83
trans-1,2-Dichloroethene		20	100	17.3	7.1	22.5	10.7	12.2	<0.89	<0.89	<0.89	<0.89	<0.89	<890	<1110	<1,780	317	612	<0.89	<0.89	1.1	<0.89	0.90 J	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89	<0.89
Tetrachloroethene		0.5	5	70.9	38.7	98.9	50.4	48.9	<0.45	<0.45	<0.45	<0.45	<0.45	155,000	139,000	<900	17,000	16,800	5.6	<0.45	<0.45	<0.45	<0.45	23.3	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	<0.45	0.61 J
Trichloroethene		0.5	5	56	32.9	38.3	34	40.9	<0.48	<0.48	<0.48	<0.48	<0.48	2,080	2,470	<960	2,770	13,500	0.74 J	0.72 J	1.1	1.1	1.3	2.2	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	<0.48	
Vinyl Chloride		0.02	0.2	10.7	<0.72	2.2 J	<0.45	4.0	<0.18	<0.18	<0.18	<0.18	<0.18	1,140	1,730	<360	302	437	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	
NATURAL ATTENUATION PARAMETERS																																					
Ethane		NE	NE	<0.32	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethene		NE	NE	<0.47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane		NE	NE	19.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate (mg/L)		125*	250*	25.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOC (mg/L)		NE	NE	6.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FIELD PARAMETERS																																					
Dissolved Oxygen (mg/L)		NE	NE	1.87	0.69	0.9	0.6	0.65	-	0.5	0.35	0.74	2.21	2.9	1.72	-	-	0.46	3.47	0.36	0.52	0.42	0.52	2.19	0.33	0.66	0.46	0.44	3.36	0.68	0.61	0.43	1.91	NA			
Oxidation-Reduction Potential (mV)		NE	NE	88.3	123	-5.4	68.3	20	-	135	12.6	81.1	-30.4	108	132	-	-	-35.9	90.3	126	-7.7	42.3	2.73	87.9	167	-15.9	59.53	7.83	71.9	115	-15.5	64.9	3.53	NA			

PARAMETER	SAMPLE ID DATE	WDNR NR 140 Standards		PZ-2				
		PAL	ES	10/8/2009	1/13/2010	12/22/2010*	4/6/2011	6/30/2011
VOCs								
cis-1,2-Dichloroethene		7	70	NS-D	NS-D	<0.83	2.3	<0.83
trans-1,2-Dichloroethene		20	100	NS-D	NS-D	<0.89	<0.89	<0.89
Tetrachloroethene		0.5	5	NS-D	NS-D	19	52.7	13
Trichloroethene		0.5	5	NS-D	NS-D	1.2	2.5	0.74 J
Vinyl Chloride		0.02	0.2	NS-D	NS-D	<0.18	<0.18	<0.18
NATURAL ATTENUATION PARAMETERS								
Ethane		NE	NE	NS-D	NS-D	NA	NA	NA
Ethene		NE	NE	NS-D	NS-D	NA	NA	NA
Methane		NE	NE	NS-D	NS-D	NA	NA	NA
Sulfate (mg/L)		125*	250*	NS-D	NS-D	NA	NA	NA
TOC (mg/L)		NE	NE	NS-D	NS-D	NA	NA	NA
FIELD PARAMETERS								
Dissolved Oxygen (mg/L)		NE	NE	NS-D	NS-D	0.27	0.41	0.62
Oxidation-Reduction Potential (mV)		NE	NE	NS-D	NS-D	-7.4	44.37	-18.4

PAL - Preventive Action Limit
 ES - Enforcement Standard
 TOC - Total Organic Carbon
 NE - Not Established
 NA - Not Analyzed
 NS - Not Sampled
 NS-D - Not Sampled - Dry
 * - Indicates the value is a Public Welfare Groundwater Quality Standard
 * - Samples collected after chemical injection

NS/D - Exceeds Preventive Action Limit
 Bold - Exceeds Enforcement Standard
 J - Analyte detected between limit of detection and limit of quantification.
 The result is qualified due to the uncertainty of analyte concentrations within this range.